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A FRAMEWORK FOR RAILWAY COMMUNICATIONS

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Summary: With railways in constant evolution, with more and more ways to improve energy efficiency, and ways to sensor equipment, among others, it is important to provide them with better and state-of-the-art solutions, through a shift from traditional to more modern technological approaches. This requires more data and information being shared between systems, and, in consequence, the use of various protocols and messaging schemes, targeting seamless and heterogeneous communication. Some entities already started implementing novel approaches, such as i) the European Railway Traffic Management System (ERTMS), for signaling; ii) the SFERA Project, a messaging protocol designed for Driver Advisory Systems; iii) and railML, for timetables, infrastructure equipment data exchange, and signaling routes. Nevertheless, several other areas, especially with the growth of more general sensors that can be attached to or installed in railway systems, are also in need of some sort of abstraction solution. With this in mind, this paper proposes an innovative framework and its supporting protocol, named Railway Management Protocol (RAMP), that provides general, high-level interfaces that can be used by applications, regardless of the details of the underlying sensing solutions, custom data formats, specific methods for communication, and other features.